THE SCIENTIFIC TALE

of the

MOON'S EVER RIGID FACE

by

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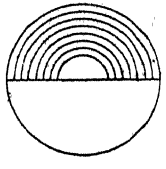


I N T R O D U C T I O N

One frequently finds that it is not the prize winners in preparatory schools who go far in later life. The standards of school-life in judging merit are different from those set by life itself. Taking but one example:

One pupil may manage to work on the right theoretical principle toward the solution of a complicated mathematical problem: he may, however, have made a mistake in the adding up of two figures right at the beginning of the work; and its perfectly plain that all the figures found as he goes along, just as well as the final result, will be erroneous. Yet as all the preliminary statements, as well as all the formulas have been rightly used and carefully worked over, the pupil has a very good chance of finding his mistake looked upon with indulgence, and even of getting a tolerably good mark, as there is, in his work, but a single mistake which was caused not by lack of theoretical knowledge, but by mere inattentiveness.

A similar mistake made in practical life would, however, meet with a very different judgment in the case of such a calculation having to form the basis of, let us say, the building of a bridge, in this case the work would be classified as completely insufficient, for only the final result, and not the type or cause of eventual mistakes will be taken into consideration.

Practical life reaches its severest verdicts on the basis of the logical realization that even the smallest inattention cannot be excused as soon as it brings about a final result which is erroneous. Perfect accuracy and reliability are qualities which rate much more highly in real life than they do in school; this view is best expressed in the saying: "Great things often spring from trifling causes".

This introductions aims at clearing the path toward a better comprehension of the conditions which reign in the selenology of our times.

Professional astronomers are, however, faced by a scientific material of such vast extension that they cannot but devote their individual forces to the systematic study of single objects on this field of our knowledge.

Lunar investigation, however, does not count among the objects to which systematic study is being devoted by professional astronomers; not only does it count among them to-day, but it has not counted among them for the last three hundred years that have passed since the invention of the telescope.

No public observatory has devoted any year-long observations to the Moon; only amateur astronomers have granted such attention, and even life-long work to this field of research, attempting to solve its enigmas and putting down in books their observations and conclusions. Some of those amateur works, more especially so the text-book on the Moon written a hundred years ago by Beer und Maedler, have come to win the high respect of professional astronomers and have developed into our official lunar theories' main sources of reference. To this day, Beer's and Maedler's book form the basis of our up-to-date lunar literature; in specialized astronomical literature but scant space is allowed to descriptions of the Moon, yet the opinions of these

research-workers who differed from Maedler, are also recorded in them.

A justification of the various lunar theories, which, generally speaking, are completely contradictory, has already been attempted in the most varied ways, but has hitherto not been successful; and an explanation of the varied observations which contradict the established theories has vainly been looked for.

Yet our lunar theories are -- as the subsequent investigations will show -- one long chain of the most momentous fallacies, based on inaccuracies and superficialities, that is to say on reasons which resemble those which make the solution of the mathematical problem, which we have spoken of at first, an erroneous one

Every error has its history.

Even the broadest river carrying large vessels is but a tiny rivulet at its fount and origin. It is the same for great errors: an initially small, and apparently unimportant mistake may become the cause of unspeakable confusion. Just as a tiny drop of poison may endanger and ruin an entire system and a human being, thus a tiny little fallacy may imperil the fate of an entire branch of our science.

The contradictions in lunar literature appear to be inextricable; the solution seems to be too difficult, and no professional astronomer wants to tie up his time and the work of his life with a task over which so many before him have failed; no professional astronomer wishes to walk into this maze from which for hundreds of years none of his predecessors have found a way out.

This is -- shortly expressed -- the attitude of professional astronomers with regard to lunar research, in consequence of which the details of lunar literature have, to this day, been left unchecked by appointed specialists.

Yet an end must be made to the uncontrolled condition of lunar research and to its careless toleration of inaccuracies and superficialities! A stand must be taken against the view which has hitherto prevailed, according to which lunar research is a mere theoretical doctrine unconnected with any other branches of natural science, and which concerne nobody but astronomers.

It is not a question of condemning old mistakes, but a matter of uncovering the sources of our errors, of retracing our steps back to the cross-roads, and thence to finding and walking on the right path.

For over two years I have, with complete abnegation and considerable financial sacrifices, attempted to bring authoritative astronomers to pronounce a scientific verdict upon my remonstrances. My treatises have not been answered, or at least not in a scientific manner; they have been returned or even ridiculed.

For two precious years I have spent my time most respectfully knocking at numerous doors, without any one door having, up to now, been opened.

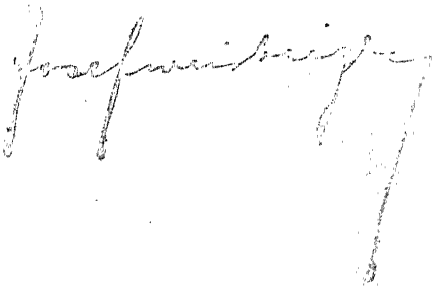
Astronomers are leaving me no other choice but that of bringing the entire matter before the public.

Reluctantly, and merely for the one reason that I am being forced into it, I am discussing things before the public -- and in soft words -- which, in the interest of astronomy, I would rather have brought up and settled in camera caritatis.

It is my firm belief that the mistakes made by astronom and their effects are cutting deep traces into the whole of our scier ific life, and that their clearing up will make possible the explan of many other natural phenomena which have, hitherto, appeared en

I therefore consider it to be my duty to make the public acquainted, in an easily comprehensible style, with the results of my research-work, thus bringing public opinion imperiously and successfully to raise the claim which is really a matter of course in the case of such an indictment:

A s t r o n o m e r s m u s t g i v e a s c i e n t i f i c
a n s w e r !



Vienna, August 1936.

all the complicated and numerous formulas involved and, by means of a whole series of mathematical examples, he demonstrates the manner in which he has achieved his results.

Maedler's formulas for the calculation of altitudes of lunar mountains have, fundamentally unchanged though more elaborate in detail, made their most recent re-appearances in "Lunar Literature" by Thomas H. MacDonald, vol.41, Nr.8, year 1930/31, of the Journal of The British Astronomical Association, and also in Walter Goodacre's (the director of the Lunar Section of the British Astronomical Association) "THE MOON" 1931. Maedler's map of the Moon as well as his text-book are based on these calculations of altitudes, and both works, to this day, serve astronomers as basis of their lunar theories, in spite of the fact that until now no general checking of Maedler's measurements of altitudes has taken place.

In my various publications +), to which I hereby refer the reader, I contend against Maedler's measurements of altitudes as well as against the real existence of lunar craters altogether, and I declare all lunar theories to be false doctrines.

My contentions are based, among other things, on the following reasons which I cite in the chronological order of their publication.

1). The dark spots near the Moon's terminator, which have been explained as being mountain-shadows, follow other laws of development than those which are valid for the formation of shadows.

+) "Die Rätsel des Doppelplaneten Erde und Mond".- "The Author challenges that Science give its Answer".- "Der Verfasser urgiert bei der Wissenschaft eine sachliche Antwort".- "An open Letter to the Astronomers of all Countries".-

2). Those dark spots are also visible in places on the Moon where, if they were really shadows, they would be out of the sight-line from our earth; and on the other hand they do not appear in places where, were they really mountain-shadows, they could not fail to be visible.

3). Neither altitudes nor depths of craters can be figured out by the mountain-shadows visible from our earth, as we can never know whether the shadow is not being shortened by falling upon a steep incline.

Neither these reasonings nor a series of other objections against the scientific theories about the lunar craters have hitherto met with any understanding among the ranks of professional astronomers.

This caused me to investigate and put to the test the whole of the important lunar literature in order to find out where lies the root of all these mistakes, and I arrived at the following results:

Before Maedler's time, as he and other authoritative astronomers have emphasized, lunar science in its entirety was nothing but patchwork and chaos, into which Maedler put order. Maedler created a foundation on which further building was possible, and on which further building has also been done. Nobody has hitherto dared to doubt, let alone to shake these foundations created by Maedler.

I therefore came to realize that it was necessary for my arguments to look for the initial mistake in Maedler's foundation itself.

In his book "DER MOND", published in 1912, Professor Franz mentions the fact that Maedler has carried out his 1095 measurements of altitudes "almost without revising them". This statement of Professor Franz', which is nothing less than laudatory for Maedler, is not, however, in the way it is expressed, in accordance with the facts

which result from the detailed statements as published in Maedler's text-book "DER MOND".

Maedler's measurements of altitudes, which I shall, later on, put through a critical test, have not been generally checked up to this day. Occasional individual checkings resulted in markedly divergent figures for altitudes; lunar literature, to which these divergences are well known, has, with various motivations, attempted to bridge them over without, however, according them any particular importance. But just recently, in Walter Goodacre's "THE MOON" (1931) that is to say, from an authoritative quarter, the view has been expressed that: "Lunar measures of Beer and Maedler made with a telescope too small for the purpose, cannot be regarded as more than approximate, in the interest of selenography generally, the time is fully ripe for someone with adequate equipment and experience to re-measure all these objects. The result of such an effort would discover many errors in the measures now so generally accepted."

These critics of Maedler's did not, however, think of the fact that Maedler's map of the Moon and Maedler's book "DER MOND" which both have become the standard works of lunar literature, are based on these very measurements of altitudes whose dependability is now being called in question.

Maedler's fame as the greatest authority in the field of selenology is not least based on his conscientious publication of his working-methods and of all details of his measurements and calculations; but, regrettably enough, this great conscientiousness has given astronomers cause to grant a whole-sale, hypnotic admiration to Maedler's works without checking up in a critical spirit whether or not they actually deserve their fame. For even the greatest conscientiousness may be part of the character of any order-loving person, while

thoroughness presupposes high mental talents.

But it is not only Professor Franz or the wellknown astronomer Philipp Fauth, who with the whole of German literature on the subject, pay so high a tribute to Maedler and follow him blindly: the whole of international literature on astronomy and the Moon for the past hundred years has stood completely under the influence of Maedler and of his German disciples and followers. The leading English selenologist Walter Goddacre in his book "THE MOON" (1931) for instance, writes about the influence which Maedler has exercised upon subsequent lunar research as follows: "The publication of Maedler's fine work instead of stimulating other to carry the matter further, seems to have had a paralyzing effect on selenography, as observers began to turn their attention to other fields of astronomy under the mistaken idea that the last word in this field of research has been spoken and the subject exhausted". "It will have been noticed that so far the progress of our knowledge of the Moon's surface must be placed largely, if not wholly, to the credit of continental observers, more particularly to the German astronomers".

The authority of Maedler is to this day so great also in English special literature that even Goodacre has not been able to free himself from it, for although Goodacre proposes a broad and general check up on Maedler's calculations, he has left this important and comparatively simple job to others, and to the future, instead of undertaking it himself or at least having it carried out under his guidance.

As the first reason for my refutal of the lunar crater theory I state the fact that the phases of development of the dark spots near the terminator, that is to say of the alleged mountain-shadows, are irreconcilable with the laws of nature which govern the formation of shadows; it is true that the phases of the dark spots do develop in the

way determined by a law of nature in so far as they re-appear in the same manner during the next similar phase of the Moon; but they do not follow that law which lies at the basis of shadow-formation. For, while in mountainous regions shadows actually do not completely vanish until the Sun approaches the zenith, the dark spots near the terminator shrink or grow very quickly at periods when the Sun must yet be but very little above the horizon of the lunar landscape concerned. For this reason it has become necessary to investigate how Maedler arrived at those 1095 measurements of "shadows" already mentioned, the corresponding altitudes for which have become the basis of the entire lunar literature of our day.

It had to be investigated whether Maedler himself did not fall a victim to a fatal mistake in his reasoning caused by suggestion, and for this purpose I have systematically arranged Maedler's measurements of altitudes in accordance with various points of view. The following results have been obtained:

Out of 1095 measurements the angle of elevation of the Sun above the horizon of the mountain was the following:

½ degree	to 5 degrees	491 measurements
5 degrees	to 10 degrees	485 measurements
10 degrees	to 15 degrees	109 measurements
15 degrees	to 20 degrees	8 measurements
20 degrees	to 24 degrees	2 measurements
	Total	1095 measurements

It results from this compilation that all measurements of "shadows" were made near or at the terminator, this being a natural consequence of the phenomenon that, when the sun rises higher, those dark spots on the Moon are not existent.

Altogether 253 individually named lunar formations have been measured. In comparing this figure with the entire amount of measurements, one might think that four measurements of every formation had

on an average, been undertaken. Yet this is not the case, on the one hand for the reason that the Eastern and Western walls were measured separately, and showed different altitudes; and, furthermore, because the measurements concern in part the altitude of the outer, and in part that of the inner slopes. Then, as Maedler assumes, many of the formations measured have several summits or craterlets, upon which Maedler, beside the name of the principal formation, has conferred Greek or Latin letters as signs of recognition. Nonetheless one may pick about 110 measurements out of the 1095 which show that they were meant by Maedler to be re-measurements, that is to say a checking-up on his own work. 61 of these re-measurements did not in the least tally with the first measurements. The way in which Maedler comments upon this and finds a way out is typical. Here are some out of many examples:

No. 2: "Uncertain in consequence of the considerable angle of elevation".

No. 6: "The unevenness of the territory accounts for the difference".

No. 7: "cf.154 and 246. These latter measurements were made under more favourable circumstances than the two former ones".

No. 22: "cf.312. Both measurements made under rather unfavourable circumstances".

No. 26: "..to be considered as an experiment only".

No. 39: "cf.958. The slope towards the West is much more considerable".

No. 50: "Incompatible with 104".

No.106 and 107: "Both figures probably too high".

No.137: "Must be rejected. cf 670".

No.181: "Incompatible with 518, which is probably due to an error".

No.188: "cf.281; 390 must certainly be rejected".

No.228: "Unfavourable circumstances".

No.256: "Certainly a mistake".

No.295: "Incompatible with 554".

No.316: "cf.330, which measurement is to be preferred".

and so forth.

The remaining 49 of Maedler's above-mentioned 110 re-measurements yield figures of altitudes which at least come near those of the first measurements; now it is important to state the fact that in the large majority of these re-measurements, that is to say in 37 cases, the very same Sun's angle of elevation as for the first measurement had been chosen; in other words , the two measurements were taken during identical lunar phases. One almost might suppose that in many cases Maedler actually waited for the return of the same phase in order to undertake his measurements, for the reason of his having observed that in this way concordance with the first measurement was more easily achieved.

A statistical survey of Maedler's measurements of "shadows" and "altitudes", however, gives an uncannily alarming picture of the carelessness with which Maedler handled these important tasks. Maedler began to work on his measurements on June 30, 1832 and completed them on April 25, 1836;but in the course of these 1394 days and nights he devoted only 110 nights to his work on measurements,and if one adds up the time which he gave to his measurements of shadows during a period of almost four years, one arrives at the very small figure of only 108 hours. In those 108 hours, that is to say one hour per night of observation on an average,

he measured 1095 lengths of "shadows", that is to say he measured 10 shadows per hour on an average, or one formation in six minutes. But one must still count out the working-pauses. In many cases he found 2 to 3 minutes sufficient for the measurement of a formation. On April 5, 1833, for instance, he quickly measured 8 formations, one after another, within 16 minutes; exactly one formation every two minutes; yet as three quantities had to be measured and noted for every formation, that is to say:

1). Distance from terminator to point casting shadow

2). Distance of point casting shadow from cusp

3). Length of shadow,

Maedler managed to carry out 8 times 3, that is to say 24 measurements with all the necessary manipulations and changes of position at his primitive telescope, and thus for each measurement only the excessively short time of 40 seconds is allowed. At such a rate which precludes all possibilities of checking up on his own work, Maedler worked on his measurements sometimes for a little shorter, sometimes for a little longer time, but at the utmost 2 to 3 hours in one night; then, with a rigid formula, and taking as foundation these carelessly observed, unchecked and entirely independable figures based on a single measurement, he figured out the altitudes of the craters down <u>to one toise</u>, i.e. 1,94 meter; in this manner conveying to his colleagues that fatal impression of great accuracy and dependability.

Only one exception to the duration of measurement work can be accertained in all these 110 nights of Maedler's observation; those are the two successive nights of October 19, and October 20, 1834, in the course of both of which Maedler made a pause of 5 hours after his first hour of measurements, and then worked for one more hour. Quite surprisingly these two measurements separate as they are in point of time, allow of an ample and, as we later shall see, a bewildering possibility

of checking up on the degree to which Maedler was an investigator who could claim to be taken seriously. For it happens that for these two nights of observation we find among Maedler's measurements of shadows but ONE SINGLE CASE in which Maedler has re-measured the same formation several times after a few hours of observation; these are his measurements 475, 489, 506 and 512 of crater "Vlacq O".

This comprehensive possibility of checking up on Maedler's manner and method of work must be discussed at some length.

The data from Maedler's journal of observation which are of interest to us run as follow:

Nr.	Date	Time of measurement	Length of shadow	Sun's angle of Elevation	Altitude in toises
475	Oct.19.1834	9.22	0.126	5 degrees 14'	1162 W
489	Oct.19.1834	15.47	0.277	4 degrees 17'	1627 W
506	Oct.20.1834	10.21	0.165	6 degrees 31'	1343 W
512	Oct.20.1834	16.30	0.365	4 degrees 53'	1803 W

Now what conclusion does Maedler draw from these great differences of altitude? Quite simply he says in a footnote to Nr.475: "The measurement 489 is more dependable, and probably also corresponds to another point of the edge; also cf. 506 and 512". And in his text-book in which on the basis of these measurements of altitudes, through more than 200 large-size pages he describes over 250 lunar formations with the greatest clearness and imagination, and with as many details as he might in the case of any familiar terrestrial landscape, Maedler says about the Vlacq: "At d the altitude of the ring-mountain amounts to 1342 toises and, opposite, at b, to 1590 toises according to a medium from three measurements, with which a fourth, which resulted in 1162 toises, cannot well be considered as compatible and also probably does not apply to b, but to some point further south."

We may therefore summarize as follows:

Maedler, has, for the very same point, found four different figures of altitude, i.e. 1162, 1627, 1343, and 1803 toises and he deals with them in the following manner:

1). He arbitrarily eliminates the first figure.

2). He arbitrarily takes a medium from the latter three very divergent figures.

3). He arbitrarily declares this last figure to be the right altitude.

4). He gives an entirely arbitrary explanation as to the alleged insignificance of the first figure.

But this chance of following Maedler's traces yields even further enlightment. The matter treated now is the waning Moon, that is to say, from the point of view of the lunar landscape concerned, the sun-set, during the course of which the Sun's angle of elevation is constantly decreasing, and the shadows must, consequently, be constantly growing. Now what does Maedler discover in the way of the sequence of developments?

1). Sun's angles of elevation $5^{\circ}14'$, $4^{\circ}17'$, $6^{\circ}31'$, $4^{\circ}53'$

2). Length of shadows 0.126, 0.277, 0.165, 0.365.

It is absolutely incomprehensible how, in the case of the third measurement, which took places about 19 hours of observation later than the second, the Sun's angle of elevation could be larger than in the case of the second measurement, and also how the length of the shadow in the case of this third measurement, during sun-set, could have been shorter than it was 19 hours before, on the occasion of the second measurement. According to the Bible Joshua was able to stop the Sun in its course; but Maedler would like to go even further, and command the Sun to wander backwards, though for a short time only; for the next, the fourth among Maedler's measurements, again shows a reduction of the Sun's

angle of elevation and an increase of the shadow's length.

The time intervals between the takings of Maedler's firs measurements and the subsequent ones were, in the cases of all other moo spots, mostly several months, sometimes even several years. For instance Maedler calculated the hight of the "Clavius" crater on the basis of a mean between five measurements taken respectively on the following dates 29/3/1833, 20/12/1833, 7/4/1835 and 6/5/1835, on which last date he took two measurements at one hour's interval from each other. He writes there ánent: "In five measurements we obtained 2866, 2784, 2969, 2348 and 2180 therefore on an average 2629 toises". This average reckoning of Maedler gives us an opportunity to catch a further glimpse of the incredibly negligent and arbitrary manner in which he played around with figures. There are here as many mistakes as he used figures.

1). The altitude of 2866 toises refers to another point, and is therefore false.

2). As against that, Maedler has overlooked a measuremen of 1972 toises taken on 17/4/1834.

3). The third measurement does not figure out at 2969 toises as Maedler states, but, according to his journal of observations, 1969 toises, that is precisely one thousand toises less.

4). The last two measurements are not 2348 and 2180 toises, as stated, but, in the correct order, 2179 and 2345.

5). It follows obviously that these figures would produce en entirely different mean figure.

<u>It is impossible to criticise too sternly so lighthearte a compilation of figures.</u>

The possibility for later measurements within the same phase was in many cases not dependent only on Maedler's own volition, bu

on circumstances the interpretation of which by Maedler suggests the following variation of Dante's quotation: "Abandon astonishment, all ye who enter here!"

Maedler observed that a large number of moon-formations could not be found again in later months in the same places even in the same phases; other formations are, despite the most careful observation, only to be found again after the lapse of months, years or even decades.

Since the so-called shadow-measurements were always made nearest the terminator, it follows that Maedler's search for the re-appearance of these shadows always premised the same or a similar position of the Sun in the following months or years. It is natural furthermore, that Maedler should have always striven to pursue and observe these often self-named "craters" which he had measured and described near the terminator, throughout the succeeding phases. But what did he in actual fact see in most cases at these points of the Moon when the Sun stood higher, or even in the following night? Sometimes there was only a lighter spot of light at the place where Maedler had measured a "crater" at the time when it was near the terminator; mostly however it happened that the place in question was not to be picked out at all from its surroundings, which when the Sun stood higher, were equally light.

This caused Maedler some astonishment, which he vents in his text-book repeatedly in vivid terms, but he sought and found for every such occurrence some explanation, mostly of a problematical nature. He did not seem to mind when his explanations were in contradiction with each other. For all such contradictions he also sought an explanation; the only thing he did not take into consideration in this matter was the Moon's surface taken as a whole. One can truly say that he was so taken up with the trees that he failed to see the forest! His work numbers 400

pages, but one may search them in vain for a clear indication of the way in which he had really seen the Moon as a sober observer. Some idea of the way in which he did see it may be gathered from certain individual observations dispersed here and there among his 250 odd descriptions of "craters" strewn in the text as tiny specks of gold blown into mighty veins of coarser mineral. Among such, the following offer points of interest:

Page:

299: "The fact that the gigantic wall of Clavius does not reveal itself in a full Moon through the slightest variation of light, is apt to set us wondering".

320: "Under a low Sun, all points of light appear as hills, but not in the shape just described".

317: "We have never seen these above mentioned 57 craters of this Mare all simultaneously".

282: "We can cite the first observation of several hundred objects on the Moon's surface, but this does not give us the right to use that as evidence for the bold hypothesis of a new formation".

284: "In the course of various lunar phases one may observe entirely different appearances of this region".

390: "It will be but rarely possible to see these hills and never all of them distinctly and simultaneously".

297: "One would in vain seek to recognize this entire lunar landscape by full Moon".

388: "By full Moon neither Neander nor any of its environs can be perceived".

42: "By high light most of the points otherwise easily measurable on the Moon's entire disk are either not visible at all,

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or thus faintly, that no measurements can be undertaken".

213: "Only 2 out of the 5 summits are visible by full Moon; these are, however, conditions which are quite habitual on the Moon".

239/240: "We could point to a large number of formations on the Moon's disk which have been discovered by none of our predecessors; but we do not wish that, if in the future formations were yet to be discovered, one would, from the fact of their not having been marked on our map, immediately jump to the conclusion that these were new formations".

206: "In the case of all the smaller craters on the Moon's surface it is a fact that they are visible neither at a very great, nor at a very small distance from the terminator".

282: "Examine this region on the map and judge for yourselves whether under such circumstances one could lay but the slightest weight on the failure to perceive a crater".

288: "The perception of such very faint objects is possible only under such very favourable conditions that years may pass without these conditions repeating themselves".

327: "On November 19, 1832, we distinctly observed the breaking up of that ridge of lights ("Lichtruecken") which make up the Wargentins Wall. On ~~March~~ Jan. 1, 1833, 5 mineral veins presented themselves of which, however, no trace was left after another 10 hours; we have caught glimpses of them several times later on, but always for very brief times only".

341: "One is confronted with a conspicious crater-ring; yet on the following evening one looks for it vainly".

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335: "One may but surmise, but never actually conclude a greater height of the mountain or crater-walls, nay, not even their very existence, from a stronger bright spot perceived by full Moon; and it is just as impossible, invertedly, to define whether and how a lunar formation, which presents this or that appearance during the phases, will look by full Moon".

236: "He who would look for these mountain-ranges by full Moon or merely at a distance of more than 12 to 15 degrees from the terminator, would find nothing".

383: "Altogether, there are many bright spots to be seen by full Moon, yet with most of them it is very difficult to define to which formation they actually correspond".

358: "Observations in this region require favourable atmospheric conditions".

349: "One must, in order to make observations, choose a time when the Sun has come to an angle of elevation of but 3 to 4 degrees, or the very time of sunrise or sunset".

349: "... which can really be perceived clearly and separately at sun-set only".

386: "... how extraordinarily great are the changes that depend solely on the illumination".

397: "... that the hills completely disappear under a higher light".

291: "As soon as the mountain-shadows begin to appear in some region, the bright rays disappear; and vice versa. As soon as the system of the bright rays has developed, not even the slightest trace of the highest ring-mountains is to be

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found even with the help of the most thorough knowledge of the locality".

This compilation clearly shows that Maedler, within one month of observation, saw each moon-spot in every night of observation differently, and further that in all regions on the Moon's surface a monthly and daily change takes place according to a law of nature; in subsequent months these periodic changes are repeated in a similar, but never in an identical manner. Since, however, Maedler determinedly stuck to his traditional crater theories, he sought for an explanation of these various , totally contradictory results of his observations, not on the Moon itself, but elsewhere. Once it was the disturbance of the terrestrial atmosphere which was to blame; sometimes the changes were ascribed to unfavourable or altered effects of the illumination; then again to the libration. And when Maedler found that he had exhausted his supply of hypotheses, he sought a way out by confessing, -- as for instance in the case of the bright rays - that he was confronted with an as yet unravelled mystery. Yet, although he defended with unbending obstinacy the theory of the Moon's disk being a rigid, lifeless planetary surface, strewn with craters, and thundered with biting criticisms against those selenologists who believed to have observed actual changes on the Moon, his conscience seems somewhat to have bothered him. For, in the concluding passages of his voluminous text-book, he writes that future selenologists should not altogether rule out the question of the possibility of actual physical alterations taking place on the Moon's surface. This is another one of the blatant instances of a total lack of logical thinking, and of Maedler's slipshed method of work; which did not look for the iron inter-working laws of nature that govern those facts, nor attempt to uncover or to sense the relations between

the most obvious of these divergencies of his observations' results. There is, however, one excuse which can be made for Maedler himself, though it does not apply to his modern successors: Maedler saw, on the Moon, a luminous surface, and, in the lights of the science of those days, that surface could be but a solid light-reflecting body. Cathodes' rays were unknown a hundred years ago; luminous gases were unthought of, and it was, for instance, assumed that the Sun's visible surface must be in a condition of liquid fire. Maedler could not help looking upon the Moon with the blinkers necessitated by the limited scientific knowledge of his days.

This treatise must, however, limit itself to the clearing up of the origin of the Scientific Tale of the Moon, without proceeding to expose its nearly magic, hypnotic and blinding force, in consequence of which this fable -- the true nature of which remained unknown --, robed in the garb of scientific truth, was able to cause so great a confusion through a hundred years. One's type-writer would jam if one were to use it to criticise, in detail, all the nonsense which has, during this space of time, been written or copied with regard to the Moon. Evidence shows that even the most highly reputed astronomers of the past century, and with them the entire specialized literature on that subject, have not only thoughtlessly followed and often misquoted Maedler, but that they have, to his errors, added an immense number of errors of their own. In most cases these are errors of the most primitive kind, which are in contradiction to facts quite easy of proof; they bear witness of the greatest superficiality, not to say negligence and to an almost incredible lack of actual knowledge. All this proves the failure to undertake but the least independent and serious research-work in selenology. This has to be stated in order to make comprehensible, at least to a certain degree, the regrettable fact that this fable

about the Moon has endured to this day.

Professor Dr. Julius Franz, director of the Breslau Observatory, twice over, in his book "DER MOND"(1912) falsely states the Moon's time of rotation round its own axis -- that is to say a mathematically determined period -- to be one synodic month, i.e. 29.5 terrestrial days; instead of one sideric month, i.e. 27.3 terrestrial days; other professional astronomers make precisely the same error also; they have, apparently, simply copied it. Yet another example: In Professor Franz' text-book "DER MOND", which enjoys the reputation of being a standard-work in specialized literature, we find the following compilation of Maedler's calculation of altitudes:

"Maedler undertook 1095 measurements of mountain-summits; these refer, almost without repetition, to different summits. The altitude was figured out on the basis of the length thrown, by the shadow, on the surroundings. Thus he reached, among others, the following results:

1	summit	of over	7000		meters
6	summits	of from	6000	to 7000	meters
21	summits	of from	5000	to 6000	meters
82	summits	of from	4000	to 5000	meters
184	summits	of from	3000	to 4000	meters
289	summits	of from	2000	to 3000	meters
320	summits	of from	1000	to 2000	meters
192	summits	below	1000		meters
1095	summits	in all."			

It is instructive to note that Professor Franz has adopted the simple procedure of adding together all of Maedler's calculations first measurements and re-measurements helter-skelter, even where they apply to one and the same crater, and thus reaches the bold, but quite false conclusion that Maedler measured 1095 summits distributed as indicated over the various groups.

But Professor Franz' book on the Moon, in its own turn, now serves to-day's astronomers as one of the sources of material in their descriptions of the Moon; thus Professor Dr.K. Graff, director of the Vienna Observatory, also quotes passages from this work. In his highly scientific book "GRUNDRISS DER ASTROPHYSIK" (1928) Professor Dr.Graff writes as follows with reference to lunar "mountain-ranges", "mountain-shadows", and "measurements of altitudes": " All formations on the Moon's surface appear at all times (!) clearly and sharply defined, with very dark, almost black shadows. The altitude of these lunar mountains can be figured out by means of trigonometrical calculations based on the length of the shadows according to the respective (!) position of the Sun".

These are statements the inaccuracy of which is apparent even to the simplest minded observer; when one finds them in serious scientific standard works that serve as text-books for this branch of science, it becomes conceivable how it has been possible for this fanciful tale of the Moon to maintain itself for such an incredibly long time and one comes to understand the boundless confusion in the whole of lunar literature.

Taking it all in all, one may say:

The coming into existence, the growth and the decrease of the fatal dark spots near the Moon's terminator which have so fatally been declared to be mountain-shadows, does occur in a manner determined by law, that is to say in accordance with a law of nature; but not with that particular law which governs the formation of mountain-shadows.

The proof for this statement can be given during any of the Moon's phases, waxing or waning, that is to say almost daily: all that is required is to measure these alleged mountain-shadows

belonging to one and the same formation every half hour or hour throughout one night, or during two consecutive nights according to the MacDonald or to the Maedler methods and from these figures to calculate the altitudes. It will than be found that these check-measurements yield divergent figures for the identical alleged crater altitude, that is to say:

1). When the Moon is in its waxing phase, and the "shadows" are shortening, along with the shrinking of these "shadows" there will be a progressive decrease of the alleged "altitudes" from measurement to measurement and they will finally come down to a mere fraction of the altitude calculated at first.

2). In the Moon's waning phase, when the "shadows" are lengthening, the subsequent measurements will yield a progressive rise of the figures for the "altitude" of the alleged "craters" until finally the altitude found by the last measurements will be a multiple of that resulting from the first measurement of the narrow "shadow" at the beginning of its existence.

Very marked divergences in the figures for altitudes when measurements were made at different times have already resulted from Maedler's various re-measurements. It was Maedler's duty as an investigator to find out the reason for these divergences by renewed and frequent measurements. He has light-heartedly omitted this and as to the doubts that have arisen, he has arbitrarily done away with them by way of hypotheses -- a thing completely unpermissible for a scientist; one time he <u>took it</u> that one or the other of his measurements had been unreliable and should therefore be rejected; another time <u>he supposed</u> that the markedly divergent "altitude" of the crater might concern another peak of the mountain, and in a third case he calculated a

medium altitude of a crater from completely contradictory figures. But never once did Maedler start out on the path which, in such a situation, would have been the only right one for him to take: that of repeating his measurements again and again whenever a case was doubtful, until the cause of the discrepancies would be revealed; for Maedler took over without examining them all the false theories of his predecessors according to which from the alleged lengths of shadows in every stage of their development the right altitude of the mountain could be found by calculation. Maedler did not realize the fact that different lengths of "shadows" on the same spot of the Moon must yield different "altitudes", and simply picked out one single, accidental stage of development of the length of "shadows" on the basis of which he then calculated his "exact" altitude of mountains. Thus did, on paper, the first crater come into existence, thus did hundreds of such craters come into existence, ring-mountains, craterlets, and so forth, and all of those Maedler drew together in a circle, in carefully measured distances and sizes, and named that circle a Map of the Moon. Than Maedler imagined how the mountains on the Moon should be approximately shaped if the moon-spots which appear with periodic alterations on the Moon's disk in the various phases had edges with slopes as high and low as he had figured out; than, with a descriptive talent worthy of a practised novelist, he described the individual craters and regions on the Moon as they appeared to his mind's eye, the product of pure imagination.

The old tradition of the Moon's craters was taken over by Maedler himself as an intangible dogma, and he hammered, squeezed, screwed and stamped his observations of many years into this Procrustean bed; wherever his numerous and really just observations were contradictory to the traditional thesis, he falsified them by sophisms, in

order to rob them of any impulsive force against the crater theory, or to deprive them of apparent significance. And thus by his work, and by posing and being for a hundred years accepted as the authorized organiser of lunar research, he strengthened human belief in a false doctrine, a doctrine which belongs among science's most phantastic Don-Quixoteries.

It may presumably be taken for granted that, in consequence of my publications, numerous astronomers and observatories in the entire world are busily making re-measurements of lengths of "shadows" and calculations of "altitudes", and it may be hoped that study of the Moon will now soon be carried on with scientific earnestness and a thorough spirit of investigation, and that, in consequence, the theory of moon-craters will be recognised to be absurd.

It will then be possible, by parallel comparative reasonings, to examine and arrive to an understanding of some natural processes on our earth which have so far defied the efforts of investigators in determining their purposes and relations.

Chapter II.

ABOUT THE HISTORY OF THE SCIENTIFIC TALE OF THE MOON

" The Mappa selenographica of Beer and Maedler appeared in four parts in 1834-1836 and is, to this day, the best and clearest map of the Moon which we possess. A thorough orientation on the Moon was made possible by it, and ended the former state of confusion caused by the older maps, where frequently the case occurred that it was not possible to find objects drawn on the maps through the telescope. It is true to nature everywhere, except in the case of some landscapes which are close to the edge, and therefore difficult. The text-book "DER MOND" by Beer and Maedler appeared in 1837, with detailed descriptions of the lunar landscape, and may be called a classic."

This verdict on Beer's and Maedler's work, called "Maedler" for short, is a literal quotation from the book "DER MOND" by the college Professor Dr. Franz, director of the Breslau observatory, who is said to be the greatest expert on lunar science among German professional astronomers of the XX. Century, and whose verdict on Maedler has consequently become, generally speaking, a common estate of our own day's lunar literature.

Maedler's book rests in the libraries as peacefully as the sleeping beauty in her castle, and professional astronomers, or those who aim at becoming professional astronomers have just a little interest for it as they have for any practical observation of the Moon. Of course this book does not count among the prescribed university text-

books, as those latter ones are written by contemporary college professors; Maedler's book is only mentioned in those books in about the same vein as it is mentioned in Prof. Franz' book on the Moon.

Yet Prof. Franz' book on the Moon contains several proofs of the fact that Prof. Franz has not even carefully read this book of Maedler's, to which he accords such high praise, from the first to the last line. He has, for instance, as has already been mentioned in chapter I., published a completely false survey of Maedler's measurements of altitudes. Franz might also have avoided the mistake of giving the Moon's time of rotation as one synodical month if he had really carefully studied his "Maedler"; for Maedler, in a chapter devoted to the subject, states the time of rotation quite correctly as being one sideral month. Franz also contradicts Maedler strongly on various points concerning other fundamental questions thus revealing his own ignorance of Maedler's views.

An alarming laxity and an incredible lack of understanding for the necessity of doing precise work can be traced all through lunar literature in its totality. Prof. Franz' verdict on Maedler becomes devoid of any scientific value the moment it can be proved that Prof. Franz did not even thoroughly know Maedler's textbook.

To professional astronomers, without excepting even Prof. Franz, Maedler's book on the Moon has become at its best a kind of work of reference, something like an encyclopedia which nobody even thinks of reading carefully from the first to the last page. Astronomers had, and have to this day no idea how worth their while it would have been to have undertaken this labor, keeping, at the same time, their own liberty of judgment.

The best of living English selenologists, director

W. Goodacre writes in "THE MOON" (1931) that "The publication of Maedler's fine work instead of stimulating others to carry the matter further, seems to have had a paralysing effect on selenography, as observers began to turn their attention to other fields of astronomy under the mistaken idea that the last word in this field of research had been spoken and subject exhausted".

Goodacre's general verdict on astronomers in this connection also tends to prove that none of these observers has ever carefully studied Maedler's text-book.

Yet it would be injust and incorrect only to point out the mistakes of Maedler's work without also mentioning its good side, and Maedler's laudable qualities and achievements. It will be only after acknowledging Maedler's good points also, truthfully, that we shall get a living picture of this extraordinary man.

Whatever may be the viewpoint which one takes toward the results which Maedler based upon his painstaking, diligent, and exceptionally numerous observations, one must think highly of the way in which, by way of exact observations and by conscientious descriptions of his methods of operation, he placed at the disposal of his successors on the line of lunar research all possibilities for checking over the entire structure of his work, and that in the most open-hearted manner; it is not Maedler's fault if nobody made use of these possibilities. Maedler, in fact, went even further. In some places he even called attention to the weak points in his work, and he has expressly pointed out those parts which he considered as the weakest, the most inconsistent and most in need of revision. He actually encouraged further labours by himself terming his own work as a mere starting-point.

In order to give its full weight to this fact it is

necessary to quote literally some passages of Maedler's book on the Moon:

Page 25: "It is sufficient if our work be a useful foundation for further investigations, if it be the first attempt carried out with some rigour, and which will leave later observers not quite so helpless and perplexed as former selenographers have left us".

Page VI (Preface): "We do not fear to have those dissatisfied, who are capable of considering the limitations in the possibilities for our enterprise. Mistakes and faults of every kind will prove to have been inavoidable in spite of all our efforts: future observers will have an opportunity of making no small amount of improvements and rectifications".

Page 26: "It could not, in fairness, be excepted of the observatories which are more than sufficiently burdened with other labours that they should devote a series of years exclusively and incessantly to one single object (local selenographic measurements), which stands in but slight relation to their other labours".

Page 27: "May it be granted that in our days in which so much activity and so much eagerness are being deployed for natural sciences as well as for astronomy, and promise to bear such magnificent fruits, selenography be left no longer empty-handed, as has hitherto been the case".

Pages 402 and 403 (Epilogue): "A basis will be given by our work, and the future investigator will no longer have again to disentangle a chaos, except perhaps in the case of regions to which the telescope used by us could not yet pierce and which have been mentioned in the respective passages. The source of all those mistakes, which used so frequently to occur, is, as we hope, now closed forever to the attentive observer; and future labours will not, as most of those hitherto

carried out, remain unfinished for weariness or despair of success".

How little, or, more rightly, how not at all Maedler's hope for a continuation of his labours through future astronomers has been fulfilled is a point which, as has already been mentioned, not only Goodacre, but also Germany's most prominent lunar expert of our days, Ph. Fauth have discussed. In "HEVELIUS" (1922) he says on page 316: "The age which stood under the impression of the blessings of Herschel's observations know more urgent tasks than that of investigating thoroughly the Moon's apparently ever rigid face. Thus in fact no observatory or national institution has taken pity on the deserted field, and it has, to this day, been left to private endeavour so far as it was a matter of making pictures and maps."

Beer's and Maedler's book on the Moon, this team-work of two authors who cannot be judged on the same line (Beer was a banker and Maedler an astronomer) is a mixture of the greatest contrasts.

In many passages of his book Maedler contradicts himself; but at least he does this quite openly, one might almost say, with a certain naivete, and in a manner which makes possible for anybody who reads his book attentively and critically to find out his contradictions. Thus Maedler goes to war against all his predecessors, and, more especially, against his predecessor Schroeter, whom he blames for having erroneously claimed to have observed actual, physical changes on the Moon's surface, on pages 185, 194, 195, 201, 202, 220, 240 and in many other passages. On page 240 Maedler says about Schroeter: "The wish to find the trace of as many changes as possible has guided his pen in this, as in many other statements."

But in his epilogue on page 403 Maedler calls back his fundamental view on this matter, which he has expressed in so many other

passages, in a manner which might make one think that he were dealing with a question of minor importance by the following remark: "It is not probable that everything down to the smallest detail should, on our neighbouring planet, be really as rigid and immutable as it is, on the whole, represented, and if we have believed it necessary that we should raise our opposition against all statements asserting such changes, we should, at the same time, not like to discourage further research on this line; for such research would certainly be worthy of any efforts that were made."

This far-going limitation of a view (which had formerly been uncompromisingly pronounced) in the shape of an inconspicuous insertion in the epilogue treacherously unveils the uncertainty, and the doubts dwelling in his subconscious mind, of which Maedler himself was possessed; it also shows the danger which was bound up with the manner in which Maedler's book was made use of that is to say as a book of reference. Anyone could now, without an exact knowledge of the entire book, very easily take the one or the other of the two viewpoints which were both represented in Maedler's book, to be the only correct one, according to whether one had happened to look at one page or another of the book; champions of two principally opposed views were now in the situation both of them to refer to Maedler.

This is the way in which one may account for the fact that Maedler's eulogists, to day's astronomers, and among others, also Prof. Franz, in many quite important questions take viewpoints quite opposity to Maedler's without mentioning and obviously without even realizing the fact.

Thus for instance did the deep blackness of the alleged mountain-shadows beside the most glaring light force later

astronomers to account for the lack of any transition, that is to say of any dawn at sun-rise or sun-set, as Maedler had not yet thought of discussing this phenomenon; present day astronomers give the alleged absence of a lunar atmosphere as the cause of this phenomenon.

On page 104 Prof. Franz describes this phenomenon as something which is experienced by a selenite in the following manner: "Yes, this shadow, -- as no gaseous envelop is there to spread a diffused light and there exists no trace of a dawn, -- is such a deep black that the territories on which it falls appear to be invisible, non-existing. In places where light and shadow border on one another one might believe oneself to be stepping into an abyss."

The following description of Clavius R in Maedler's text-book (page 298) stands in complete contradiction to Prof. Franz' view on the matter.

"When the shadow has retired approximately as far as c, then, the curved line of dawn already shows on the East on horizon in such a way that the foot of the very same ring-mountains, which are already illuminated, is still grey in its hues. It can no longer be complete night, although the sun may be yet below the horizon, in consequence of the reflection thrown by the gigantic mountain walls."

On page 212 Maedler further writes about the lunar north pole: "The peaks of these mountains will be eternally illuminated by the Sun, they know of no night, and, consequently, the planes, particularly those on the pole, experience but a change between dawn and day."

Just as in the case of an accounting for the alleged absence of any dawn, Prof. Franz also sharply contradicts Maedler with his description of the manner in which an eventual selenite must see the sky.

On page 22 Maedler describes a lunar night on the lunar hemisphere turned toward us: "It must be taken that, in consequence of the reflection of light through the earth, which is 13½ times as strong as our moon-light, one sees little or nothing of the weaker fixed stars, planets and comets, and that any exact observations will have to be limited to the brighter celestial bodies, the larger planets and the earth before all."

Diametrically opposing this Prof. Franz writes on page 104: "On an average we see the Sun from the Moon as having the same diameter as is seen from the earth, yet the Sun stands out in even stronger relief against the velvet-black sky and beside it one perceives, also by day, the stars entire host if one but takes up a position where the Sun cannot be blinding. For there exists no blue sky."

There can be not doubt about the fact that Prof. Franz has not even known the fundamentally opposed views propounded by Maedler and that -- incredible as that may sound on the part of a scientist -- he has not even thoroughly read Maedler's text-book which he has termed as "classic"!

If one studies the paedagogical building of professional lunar literature with intense attention and the desire to understand the logical connections, if one sees men, who all must be taken seriously and who, in fact, do take one another seriously, defend these innumerable and contradictory views, of which the quoted ones represent but a small selection, one is tempted to believe that one has mistaken the handle and that, instead of walking into an edifice erected by a body of scientists, one has fallen into a mad-house. This must be said outright, for it is in the interest of the author of this treatise that the attention of his readers should be kept awake, and that any

unfounded mistrust should be kept away from them. For, considering the high standard of astronomy on other fields, and more especially on that which deals with the exact knowledge of the course of the heavenly bodies; considering the high respect which astronomers rightfully enjoy, both socially and scientifically, in consequence of their merits on other fields of activity, there might arise the unfounded suspicion that it not the subject treated be so incredibly confusing, but that it be the critic who does not properly grasp the inside connections of the matter.

Yet it lies within the critic's possibilities to call lunar literature itself as an important witness for the justness of his statements, as the chaos of lunar literature has been sharply censured by authoritative lunar experts, that is to say by Maedler himself as well as by Fauth. On page 25 Maedler says that the works of former lunar research workers had "left him entirely helpless and perplexed". On page 402 Maedler says: "The future investigator will no longer have again to disentangle a chaos".

Philipp Fauth who, at the end of forty years of pains -- taking observations of the Moon realized the untenableness of the old lunar crater theories and looked for a solution of the lunar question in accordance with the -- scientifically inadmissible -- "Welteislehre", writes in "MONDESSCHICKSAL" on page 202: "Anyone who takes interest in the magnitude of the confusion on the field of lunar literature, in the degree of helplessness or in the fruitful imagination of selenologists outside the field of the "Welteislehre" should read numbers 4/6 of Sirius, 1923, in which the Moon is chanted about in various sweet melodies."

Ph. Fauth's books certify his depression and the despair

about decades of work done in a direction realized so late to be the false one; yet even Fauth has remained the victim of his blind, uncritical belief in older authorities.

In "HEVELIUS" (1922) Fauth says on page 332: "He who approaches the Moon with the intentions of a research-worker must keep awake within himself the sense of the fact that we are faced by a new, strange, and completely different world, on which not even the physical circumstances of our terrestrial home may be used for comparison". On page 338 of the same book Fauth continues: "He who wishes to turn his attention to a furthering of lunar research should, from the very beginning, make use of the observations and experiences of his predecessors, so as not to prepare unnecessary hindrances for himself." And going further we find, also in Fauth's case, the unlimited, full acknowledgement of and respect for Maedler's work expressed on page 25 of "MONDESSCHICKSAL"(1925) as follows: "I.H. Maedler's lunar map of 96 cm diameter and his textbook of exhaustive richness have appeared about 90 years ago and form the basis of our knowledge to this day."

Yet Fauth's writings also prove that Fauth has not studied Maedler's book with adequate thoroughness, and, more especially, that he has not paid sufficient attention to the restrictions which will be discussed more in detail later on.

It was known to both Fauth as well as director Goodacre that individual re-measurements of Maedler's measurements of altitudes have yielded the most varied and divergent figures, from this fact director Goodacre draws the conclusion that it is high time that Maedler's measurements of altitudes should be checked and that many mistakes would be discovered ("THE MOON", page 14). Fauth, on the other hand, only has one of the many sophistic explanations so popular in

lunar literature, at hand, and says in "MONDESSCHICKSAL" page 42/43: "Only those mountains which throw the black shapes of their shadows on fairly even territory can usually be measured with great exactitude. In most cases the last peaks fall upon unquiet field. Even in the flat "Mare" it may occur that between the beginning of the shadow and the farthest end of the umbra there exists a quite considerable difference of altitude. Thus is also happened that the very same observer, on different occasions, found different figures of altitudes for the same mountain."

Yet without any exception all of Maedler's successors have neglected this general checking of his measurements of altitudes which had been realized to be so urgent; they have -- each in his own manner -- managed to get out of this apparently ungrateful task.

In chapter I. the way in which Maedler went to work with those figures among his own re-measurements which were so markedly divergent from those of the first measurements, has been described. Once he assumed that they concerned another peak of a mountain-range, or he eliminated them supposing that the measurement was erroneous, or, finally, he took a"medium" from various divergent figures. On the basis of statistical observation I have, in chapter I., pronounced the supposition that he had, for his re-measurements, waited for the return of an approximately similar angle of elevation of the Sun in the subsequent months, for the reason of his probably having observed the fact that this was the most likely manner by which an accord between the re-measurement and the earlier measurement might be achieved. This supposition may be strengthened by the following remark which we find inserted in Maedler's text-book on page 229. Maedler says about "Menelaus R": "We found a depth of 1027 toises. A later measurement undertaken under an angle of illumination doubly as large ($12\frac{1}{2}^{0}$) yielded, as might have

been expected, a considerably lower figure (866 toises), yet in the case of this measurement the end of the shadow was so far apart from its center that both measurements may be well taken to be correct and concerning different points of the concavity."

In other and quite analogous cases in which Maedler -- also under strongly divergent angles of elevation of the Sun -- reached far divergent figures of altitudes, he did not, however, draw the same conclusion, but instead calculated a "medium" figure, thus for instance in the case of Abulfeda W and of Reinhold O. This is a good example of the arbitrary fashion in which Maedler did not merely go to work with figures generally, but also for the inconsistency with which he arbitrarily denied principles established by himself as the case might be.

Maedler who, in his labours, drew no other possibility into consideration, and was incapable of drawing any other possibility into consideration than that of the visible hemisphere of the Moon being a rigid, solid body, considered his own inexactitudes in all measurements as being of secondary importance and meaningless.

Maedler's extensive measurements however, concerned two further kinds of calculations beside the measurements of shadows destined for the figuring of altitudes: A). Concerning the fixation of the places of the most conspicuous moon-spots, which he called fixed points, that is to say their local situation on the visible hemisphere, the co-ordinate, respectively its selenographical longitude and latitude. B). Concerning the calculation of the diameter of the most conspicuous moon-spots, called craters.

Maedler had prepared a system of his own for the first type of calculation. He mostly measured each fixed point 8 to 12 times; if, already in the course of some re-measurements, he perceived a marked

divergence from other measurements, he did not even put it down into his journal of observations. Then he compared the remaining and registered measurements and placed a + beside all markedly divergent results. Some measurements of moon-spots which he was unable to find again later on he marked with a ? . Then he put together the measurements -- leaving out the measurements marked with + -- and now he had figures which were none too contradictory, as the contradictory marked with + had already been eliminated -- and, from this series of figures, he drew his ominous "medium"-figure. Without checking up on them he also used individual figures of measurements carried out by other selenologists for these compilations. All these local determinations of Maedler's fall into the period from April 19, 1831 to December 20, 1831, during which time in altogether 56 nights of observation he worked on this subject and noted 919 measurements with 92 fixed points, that is to say on an average 10 measurements for one fixed point.

Also in this case Maedler has -- influenced by the "Moon's rigid face" -- granted no other meaning to those markedly divergent results than the assumption of having been mistaken.

But these measurements of Maedler's with their far separated local findings of one and the same moon-spot at different, sometimes subsequent points of time are striking proof for the mobility of these moon-spots and of their local displacements.

If, for instance, a geometrist were to undertake his measurements for the building of a provincial railway, or an architect for the blue-print of a manufacturing plant with a similar carelessness, both of them would not only be risking their bread and butter, but they might also expect to have claims for damages brought up against them. Maedler had to fear neither one emergency nor the other, for in the case

of the Moon it is "merely" a matter of science, and science itself has shown so little interest in this case that Maedler's mistaken have remained unnoticed for a hundred years.

Yet if one were inclined to think that Maedler's carelessness in the measurement of altitudes and local definitions could not be surpassed, one soon learns better when one investigates Maedler's measurements of the "craters'" diameters. Maedler has altogether figured out 147 of those "diameters". He himself says about them on page 88: "Most craters have been determined but once, by way of a series of ten focusings, alternately right and left of the threads' cross-point. For most of these measurements the most propitious time is when they are close to the terminator and the main ridge alone is visible."

In this case Maedler did not even trouble to do any checking in a subsequent night of observation or during another phase!!

This is the truth about the foundations of Maedler's map and text-book, which latter has been termed by Prof. Franz a classic work and by Fauth as the foundation of our selenological knowledge to this day.

Maps of the Moon may be compared to a picture which, by way of photographic fixing, shows events which in reality are far apart both locally and chronologically, jammed together in such a manner as to give an impression of being events which are chronologically and locally co-ordinated. No human eye has ever actually seen the Moon such as it is represented on lunar maps. All territories on the Moon are, on these maps, represented in the way in which selenologists, in accordance with their doctrine, have constructed them from the dark spots along the terminator, in their fanciful minds. This fact is not pronounced with this degree of plainness anywhere in lunar literature in spite of the

fact that it logically results, for one thing, from countless remarks which Maedler makes himself. Maedler says, for instance, on page 191: "We have considered it a necessity to draw up detailed descriptions of the territories depicted on our map, as the Moon may never simultaneously show all, or even a considerable part of that which is depicted on our map."

Maedler's lyrical outbursts, with which he intersperses the text of his descriptions of individual craters in a state of religious ecstasy, are a chapter in themselves, and one highly interesting to a psychologist. He describes what never has been seen and never can be seen in about the same manner in which the emperor's non-existing garb is enthusiastically described in Anderson's fairy-tale "The Emperor's Robes". Here are a few examples :

Page 298, Clavius R: "The steep, and in places, almost wall-like slope shows everywhere the traces of gigantic after-effects of the eruptive force. The sight of a sun-rise over the plain of Clavius through a good telescope is a thing unspeakably magnificent."

Page 368: "Further south one perceives a beautiful ring-mountain bearing many peaks and a row of six craters of the smallest size which are difficult to recognize. The great law of nature: Unity in variety, harmony in apparent alternation of hazard, is unmistakeably evident."

Page 373, Petavius R: "It's gigantic double wall with the unusually sharp contours of the interior mountain-foot and the glittering wreath of its high peaks offer a magnificent view. But who would think, in the face of this view, that at an angle of illumination of 40° to 50° it already would no longer betray its existence by the smallest trace!"

One might multiply the number of those descriptions of lunar landscapes in which Maedler revels in his auto-hypnosis. Strictly speaking, however, all of Maedler's descriptions of craters are an outcome of this magic spell.

The forcible distortions of any kind of logical thinking develop into a perfect symphony of nonsense when it comes to Maedler's explanations of the alleged mountain-shadows. Maedler states, without flickering an eyelash "shadows on the wrong side, the side turned towards the light" on pages 319, 339; "in spite of great depth" he finds no shadow at all on page 331; he arbitrarily and according to the emergency explains the nuances of the dark spots near the individual craters alternately as a local "penumbra" (pages 222, 94), and then again as local "dawn". The statement that these alleged shadows already vanish when the Sun comes to an angle of elevation of 20 to 25 degrees, or even earlier, can be traced through Maedler's entire book, and becomes apparent, first and foremost, through his measurements of altitudes; nonetheless Maedler, when it comes to the "total survey of the Moon's surface" and to the enumeration of the individual types of "mountains on the Moon" emphasises their extraordinary steepness, the sharpness of their inclines, and their gigantic slopes on the basis of his calculations (pages 125, 126, 127, 130, 131). Maedler passes over in silence the contradiction which lies in the fact that steep mountains with gigantic inclines are to lose their shadows when the Sun comes to an angle of elevation of 25°, or even earlier.

It would be more than wearisome if one were to analyse all the nonsense contained in this book from the logical point of view; one may well take it that the examples already brought forth are sufficient to show in what spirit this "classic work" has been written, and

that one may in future do without any more quotations of the material contained in it. It is but necessary yet to draw some attention to the "Preface" of this book.

It is a well-known fact that prefaces give some information about the intentions of the author and the contents of the book which they precede, and for that reason -- this is also true in Maedler's case -- they are actually written as very last part of a manuscript. In contrast to his individual descriptions Maedler's preface has been written, at least partly, in a kind of sobered mood. That is to say that, at the end of his year-long labours and after the completion of his text-book Maedler himself says about his measurements, which are the basis of his map and of his book on page IV of the preface:

"In future times our measurements will -- we hope -- be replaced by more extensive, more frequently repeated, and more rigorous measurements than ours, and more stringent methods of calculation will even be made use of. It what concerns, more especially, the measurements of the mountain altitudes it is bound to be, in regard to the exactitude of results, with necessity the weakest part of this book, and the greatest labours on this field are yet ahead."

In high astonishment one must raise the question how it was possible for Maedler to believe himself in the correctness of his deductions from his observations, when he sees himself, finally, forced into the admission that the backbone of all his descriptions of craters his measurements; that is to say of altitudes, is the weakest part of his entire work! There lies, in these words, not merely the admission of a consciousness of guilt, but also a protest against future accusations on account of the errors commited by him! If one were tempted to

look upon these words as the well-justified caution of a scientist animated by the tenacious spirit of the research-worker, this idea is contradicted by the fact that Maedler was appointed to a good post as director of an observatory after the publication of his book, and that he carried on his activities as astronomer and creative writer on his special field through several decades without in the least taking himself the advice which he had given to others; that is to say of carrying on his lunar research-work. It is perfectly plain that the re-measurement of the so-called mountain-peaks is the bitter apple which neither Maedler nor other astronomers had any desire to nibble at.

Maedler's map of the Moon which, to this day, forms the foundation of all subsequent maps of the Moon, was been "completed" by his successors in quite a noteworthy manner. The number of formations on later lunar maps amounts to the multiple of the number which are marked on Maedler's map. The method of procedure used by these successors was the following: If, on some occasion, they perceived a moon-spot in a place where no crater had yet been marked, they simply marked it down. But in case there already existed an entry made by Maedler or some other selenologist, they claimed to see the old well-known crater, even though it might, in shape, size, intensity of light and other characteristics, differ from the first. On the other hand: if the successors found an empty spot in some place where Maedler had entered a crater, they declared, as Maedler's good pupils, that in this case it was the kind of crater which, in consequence of a different libration, a changed illumination, and so forth, was but rarely visible.

Director Goodacre's book published in 1931, "THE MOON", is a collection of those numerous contradictory observations made during the last hundred years. Director Goodacre mentions these contradictions

in the case of 520 named craters, among which there is hardly one of which different observers do not report different observations. It is unnecessary to point out any details, one has but to look at one of the three hundred pages of Goodacre's book, chosing any page of the descriptions whatever.

The struggle which I am waging against the lunar crater theory forces me to carry on this method of digging up errors which is fundamentally antipathetic to me, it forces me into the even more unpleasent task publicly to proclaim the distasteful discoveries of this search for errors. I should like to say on this occasion that I am still doing my best to hold back, and am hoping to be spared the necessity of publishing further material which might discredit the astronomical world. May astronomers take into consideration the fact that over two years have now passed since the publication of my monograph "Die Raetsel des Doppelplaneten Erde und Mond" known to them, and that they would thus have had sufficient time to settle these matters in camera caritatis and give me a satisfactory answer without any harm being done to their authority. Do astronomers want to call forth an unravelling, before the public eye, of these theories which have been based on the lunar crater theory, thus for instance of the various theories concerning the origin of the lunar craters, of the Albedo-theory or of the theoretical division of stellar bodies into formations of points and formations of planes for the purposes of astronomical photography?

Carrying on the struggle against the lunar crater theory might perhaps reveal the fact that the larger part of the responsibility for the long existence of the scientific fable of the Moon does not lie with Maedler, but with the professional astronomers of a later generation. For the very fact that it is possible to carry

on the fight against the lunar crater theory on the basis of the observations published by Maedler himself, means, in some ways, Maedler's rehabilitation. His eagerness in collecting all observations even those which he had to leave unexplained for the reason of their contradicting his theories, is really exemplary and one may even make allowance for calling this part of his labours a classic work. Maedler's text-book contains yet numerous observations which have not now been mentioned, and which might, with strong effect, be brought into the field as arguments against the correctness of the lunar crater theory, thus for instance his observations of solar and lunar eclipses and many others.

Yet the purpose of this treatise is a constructive one, it is to clear the building-ground for a new scientific edifice, and the struggle against the lunar crater theory is but a means to that end.

It results clearly from Maedler's records that the moon-spots are in a state of constant development, and also of constant motion; and even their local displacement results from his measurements of their selenographic longitudes and latitudes. Even if those motions are, in their details, as imperceptible as, for instance, the growth of plants, it is yet easily possible to state these stages of development of the individual formations, craters, and so forth, by means of measurements repeated at short intervals; each measurement would have to state the local position, that is to say the selenographic latitude and longitude, as well as the size and shape of the measured formation. This work could be effectively furthered by means of individual, as well as of series of photographs. Of course what will be wanted are snapshots, and, in order to achieve quicker results in clearing up the matter, the collaboration of observatories which are geographically far apart will

be necessary so as to undertake uninterrupted systematic observations of certain moon-spots from the moment of their origin to their disappearance. This would be the most magnificent subject for a film which would allow us a profond insight into the deep secret workings of nature. Understanding for the fact that the indistinctness of most lunar photographs is not due to a disturbance in the terrestrial atmosphere, but that these pictures rightly reproduce the motions of the Moon's gaseous envelope, must be generally spread. The disturbances in the terrestrial atmosphere, which permits an extension of the time of exposure to many hours in the case of fixed stars, does not really affect the photographs of the Moon.

The comparison of the numerous measurements and pictures thus taken of one and the same lunar formation during its development, from the moment of its origin to the moment of its disappearance, will then give a clear and unerring picture and an irrefutable proof of the mobility, changeability and of the displacements of the moon-spots, and, consequently, of their gaseous condition also.

The cinderella of astronomers as which lunar research has hitherto been treated, should become a princess to whose humble service astronomers are called; for there is no other stellar body in the skies which may give us so many revelations about heaven and earth, as the Moon who, in consequence of his vicinity and his all-surpassing magnitude on the nocturnal sky is most capable of disclosing cognisance of the stellar world to us.

Chapter III

THE TRIUMPHAL PROCESSION OF GALIMATIAS

IN THE SCIENTIFIC TALE OF THE MOON

No cobler and no joiner, — to mention but two examples — could afford to take the measurements preceding the work assigned to him with a carelessness, similar to that with which Maedler undertook his calculations of lunar crater altitudes. The public will certainly be greatly surprised on learning that a noteworthy and highly famed representative of science did not even bring as much exactitude to his scientific works as one takes for granted in a simple craftsman. And no one could very well take offense in case the astonishment of the public were to progress into loud indignation over the fact that this extraordinarily careless piece of work should, through a hundred years, have formed the sacrosanct basis of a highly respected branch of our science, and, through such a long period have been permitted to mislead so many other developments in other branches of science.

Director Goodacre in his book "THE MOON" (1931) says that Maedler's measurements of altitudes "cannot be regarded as more than approximate". This verdict must be rejected for the reason of its being too mild and beside the point; even if the moon-spots really were craters one could but classify Maedler's measurements of altitudes as incorrect and erroneous. In all cases which permit of a checking up, it is possible to prove such gross negligence and such an incomprehensible carelessness in the arbitrary manner in which observed figures were used, that any confidence which one might have in figures that allow of no checking, is completely undetermined. This means that even if these moon-spots actually

were craters, the claim that Maedler's entire work be rejected in its totality as unreliable must be raised even more categorically against astronomers; at the same time there must be raised the claim that all measurements of altitudes be renewed carefully and under proper control, and used as basis of a completely new and independent description of the Moon.

Of course one should not content oneself with demanding that astronomers carefully and conscientiously go over Maedler's formulas and carry out reliable measurements, but one would first and foremost, have to investigate whether every item of Maedler's formulas, is, in itself absolutely correct and the result of careful forethought; also, whether it is actually possible -- always taking as granted the fact that the moon-spots really be craters -- to figure out the craters' real altitudes with the help of these formulas. Yet even a superficial study of these formulas clearly reveals the fact that this is not the case. For Maedler, as well as his predecessors and his occasional successors, have figured out the altitudes of the craters trigonometrically from the visible lengths of those dark spots which they took for mountain-shadows. They have not taken into consideration the facts that:

a) in most cases we could not see the entire length of lunar mountain-shadows, but merely some fraction of them from our earth, for the reason that, especially near the Moon's edges, the larger part of such mountain-shadows would be out of our sight as the mountains standing in front would come between them and us, and the larger part of the shadows must therefore be hidden from our sight;

b) that no correct altitudes of craters could ever be calculated from these alleged shadows, which can be seen only when the Sun stands at a low angle of elevation, simply because one could never find out how large a part of the shadow would be lost to our sight by falling

upon a neighboring steep slope; therefore appearing much shorter to our sight.

If Maedler had but taken those two facts into his considerations he would have appraised crater altitudes of not only 5000 to 6000 meters on the Moon's edges - which he actually believed he had found - but his appraisels would probably have reached altitudes of 25.000 to 30.000 meters ! Maybe that such figures would have startled him and that he might have asked himself the question whether he was not following a wrong track; he might have discovered the fact that, especially on the Moon's eastern and western edges, we perceive these alleged mountain-shadows in places where we could not possibly see them if they really were mountain-shadows for the reason of these edges being regions of which it can be proved that - always keeping to the thesis of the Moon's rigid face - it would be impossible to see our earth from them and that, consequently, these regions also could not possibly be visible for us. Maybe that Maedler would then have realized that, again for this simple reason, the dark spots along the terminator actually cannot be mountain-shadows.

Step by step, Maedler, as well as all lunar research workers who came before him and who came after him, met with such observations; observations which contradicted the theory of the Moon's ever rigid face. But this theory was "taboo" and nobody permitted to touch it; and for this reason, through 300 years, auxiliary theses were set up, which were meant to prop up the endangered main structure of the theory and to keep it from crumbling, as props might keep an endangered building.

The contradictions in the figures for crater altitudes, yielded by individual and occasional re-measurements and control measurements, in spite of their conspicuousness, failed to draw due attention; the wide range of consequences which this belittling of a fact was bound to

have remained completely misunderstood.

In accordance with the assumption of the formulas set up for the purpose of measuring altitudes, figures at least approximately similar for the same point should in most cases result from the calculations based on the shadow's length at a changed angle of solar elevationalso; yet the re-measurements and control measurements of the alleged mountain-shadows at changing angles of solar elevation, almost always yield progressively more and more contradictory figures for the same point; by this exact, irrefutable, and therefore scientific proof, a proof which no longer allows of any doubt, is given, for the fact that the dark spots along the terminator on the Moon neither are, nor ever were, mountain-shadows.

It is impossible to lay too much emphasis on the fact that the explanation of the dark spots along the terminator as mountain-shadows in the one proof given by astronomers for all lunar crater theories. Without these mountain-shadows the calculations of the lunar craters altitudes would not have been possible; without calculations of these altitudes there would be no "craters" on the Moon, and without craters there would be no lunar crater theory.

Once the proof of the fact, that the dark spots along the terminator cannot possibly be mountain-shadows is given, all the theories which astronomers have hitherto taught about the Moon's surface have lost their mainstay and must crumble to pieces like a house of cards.

Maedler's mistakes have, in this treatise, been placed in the lime-light; yet its purpose is not that of representing Maedler as some great malefactor. It is true that his work is a terrific and gigantic piece of Don-Quixotory, that his book on the Moon and his map of Moon are quantity productions of nonsense. Yet this nonsense has been robed in scientific garb of the most masterful apparent thoroughness, and his reports about his own labours and observations as well as about those of

his predecessors, - which he had carefully studied, - are presented with such delusive sincerity that, for this reason alone, his work deserves to be termed a literary masterpiece.

Yet it is inavoidably necessary to investigate Maedler's work so carefully for the reason of it's being the basis of our own time's entire lunar literature. Everything which, in colleges, universities, in scientific and popular books, is being nowadays taught and written about the Moon, everything without exception - is, as can be proved, a repetition or a development of Maedler's work. Therefore if one wants to throw some light upon to-day's lunar literature, if one wants to sift the chaff from the wheat, one must start by looking over and thoroughly discussing Maedler; the criticism of Maedler's mistakes cannot but develop into a flaming indictment against the professional astronomers of both the XIX. and XX. century, and it is at them that this criticism of Maedler's work is really directed.

"The time is fully ripe" as Director W.Goodacre wrote in his book "THE MOON" in 1931 "that Maedler's measurements of altitudes should be re-measured with adequate equipments", for, as Mr.Goodacre further states, Maedler used a telescope which was much too small for the purpose and thus his measurements can, at the very best, be looked upon as approximations.

Professor Franz writes on page 114 of "DER MOND": "Maedler observed the Moon in the years 1830 to 1837 with a three and a half inch Fraunhofer refractor on the balcony of a villa belonging to the banker Beer, situated next to the Tiergarten in Berlin".

The refractor which is being used at Mount Wilson Observatory measures 60 inches, the reflector belonging to the same observatory measures 100 inches and the diameter of the lense of the newest and largest American reflector will be 5 meters !

What a childs plaything Maedler's telescope of not quite 1o centimeters diameter was, in comparison to these gigantic instruments ! It is, after all, obvious that also no other man could, under such circumstances, and with such primitive equipment, have achieved more reliable results; for Maedler's telescope would have been quite inadequate for the task even in the case of no fundamental errors of logical thought having been made.

Any applicant for an examination in astronomy will be able to state the fact that the placing of a telescope on the balcony of a villa contradicts the most simple demands which would, in our days, be made for such a purpose !! One has but to think of the care with which, in our days, even the smallest observatories are granted a solid concrete basis for their telescopes so as to weaken the influence of any terrestrial concussions !! No modern observatory is built inside a big town as one has come to realize what a hindrance street-lights, the smoke and mist of big cities, as well as the commotion caused by traffic are to really accurate work. Yet Maedler's primitive telescope was not merely placed in the heart of a big city, but on a balcony into the bargain - this being - a statement which any architect will corroborate - the most unfit spot which could possibly be chosen for such a purpose, as it inavoidably is the most unstable and unsteady part of any building !

It is necessary to bear all these facts in mind if one wants to arrive at a proper judgement. Astronomers must be drastically reminded of the tremendous carelessness which lies in the procedure of basing our own day's entire lunar literature upon the labours of scientist whose observations and measurements were carried out with such instruments, and under circumstances which, even if the instruments in themselves had been superior to what they actually were, would have excluded any accuracy, any reliability, and therefore any success for his work !

Were one to find faults in the construction of a building one would not content oneself with investigating the errors of the builders and bricklayers; one must find out whether or not errors have actually crept into the calculations and blue-prints drawn up by the architects. This is the reason why, in the case of Maedler's work, we must also find out whether all conditions which would have been necessary for the success of such an enterprise, -- for achieving true knowledge of the Moon's surface, -- would be given if Maedler were able to carry out his observations in our own days and in a modern German observatory.

If the skies were not so often clouded in our temperate zone, the Moon would be visible during about 24 nights, and even days, out of the 29½ days of his revolution.

The clouding is, however, a factor which cannot be figured out in advance, and which robs every observatory of the possibility of carrying out unbroken and systematic observations. Yet true cognisance of the Moon and its enigmatic changes can be achieved by way of continual observations only, for all these changes develop gradually, and none of them suddenly. A continual observation cannot, however, be carried out either by one individual astronomer, nor by one single observatory. It is possible only by working it as, for instance, the weather-service for the recording of atmospheric pressure, or in the manner in which earth-quakes are recorded by seismographic contrivances; that is to say by having observatories situated far apart work together on the line of a coherent system keeping in constant touch by wire and ever exchanging their observations across all political and national borders.

The incomprehensible lack of interest of professional astronomers for lunar matters is solely responsible for the fact that

such an easily practicable scheme, has, so far, not even been proposed, let alone been realized by any of the World's Congresses of Astronomers, which follow one another at short intervals.

It is thus becoming apparent that a real cognisance of the Moon presupposes quite different conditions than those which were at Maedler's disposal, and that these conditions would also differ from the ones which Maedler's successors have, so far, demanded.

There can be no doubt about the fact that Maedler himself was well aware of the unreliability of his observations and measurements, and that he realized the insufficiency of his telescope. On pages 239/240 of his text-book Maedler says that "he did not wish the lunar investigators of later days, in case they should discover formations on the Moon's surface which are not marked on Maedler's map, to assume that these were changes or new formations"; and on page IV of the preface Maedler declares his measurements of altitudes to be the weakest and least reliable part of his entire work, adding, however, the expression of his hope that these measurements would be, in the future, followed by new and more rigorous measurements carried out with the help of more meticulous methods of calculation. And further, on page VI of the preface Maedler says: "Future observers will find an opportunity of carrying out no small amount of rectifications and improvements."

Director Goodacre has criticised Maedler's definitions of altitudes, but passes Maedler's local definitions over in silence. Yet it is plain that Maedler's telescope was insufficient for the purpose of making local definitions also. Maedler also in this case disregarded the imperfection of his instrument with majestic ease. He felt himself to be the "discoverer" of new craters, he conferred names and ranks upon them as a sovereign might confer titles and medals;

he attempted to show off his own correctness and conscientiousness in a manner which was often grotesque and yet misleading. He never wearied of pointing out how much more rigorously and thoroughly he was going to work than his predecessors had done. In the case of one particular formation, for instance, Maedler goes about the job of conferring a name upon it with the following reasoning (page 331): "Newton, probably the deepest among all the ring-mountains on the Moon's surface, to which we have, consequently, given the name of that celebrated man with which all coming ages will associate the unveiling of the world's deepest secrets. It is true that Schroeter had already introduced the name of Newton, but he had placed it in another territory. Yet we have not been able to construct an ideal ring-mountain from the heterogenous particles of mountains of this particular territory, and we felt misgivings about conferring the name of the greatest scientist upon such an object."

Maedler felt his position to be but a trifle less magnificent in the case of his local definitions, that is to say the fixation of selenographic latitudes and longitudes for those particular moon-spots dubbed "craters", "ring-mountains" and so forth which he considered worthy of being chosen as "fixed points". Maedler was a pioneer on this field also. He was the first who, with a break-neck leap, overcame the almost insurmountable difficulties which opposed the drafting of a lunar map. He put aside all doubts or set up new theses to bridge them over. For every moon-spot is in a condition of constant change during every lunation, presenting itself in a different size, shape, intensity of brightness and even different location from night to night, and sometimes disappearing altogether, and thus making it, in many cases, quite impossible for any observer to state with certainty whether he actually is still faced with the same or already with some new formation.

Most moon-spots actually disappear at the end of a few nights, they can no longer be distinguished from the more or less luminous plane of their surroundings. In the chapter "A Treatise on the Origin of the Scientific Tale about the Moon" a whole series of literal quotations from Maedler's text-book are mentioned which plainly point to this fact. What Professor Franz tells us about his own experiences with this variability of the moon-spots is, however, worth recording also. He says on page 100: "It must be noted, first and foremost that the appearance of lunar landscapes is in a perpetual state of change in consequence of the different illumination and of the different libration. The first mentioned reason causes a great variance in the brightness of contiguous objects; the second, by way of different perspectives, causes a very notable variance in the formations' shapes. It is true that this fact has already been frequently stated, yet among lunar investigators every beginner imagines these purely optic, and consequently merely apparent changes to be smaller than they actually are. The author has, himself, made this same experience. The size and considerable magnitude of these apparent changes are taught but by continuous observations carried on for some time. The fact that these changes are no lasting ones is proved by the circumstance that, upon return of the same illumination and libration, the lunar landscapes again take on their former appearance."

It is necessary to devote some of our time to Professor Franz' reflections.

Attention must first and foremost be called to the fact that one of the most enigmatic "changes" of the moon-spots, that is to say their entire disappearance through weeks, months, years and even decades is not even being mentioned by Professor Franz; let alone his making any attempt at an explanation. We are therefore limited to busying

ourselves only with the two alleged causes (illumination and libration) for these allegedly apparent changes which Professor Franz does mention.

In order to choose an example let us say that an observer will, through fifty nights, find one and the same moon-spot always looking different from the first observation. It is but in his fifty-first night of observation that he is able to state that it again looks just the same as it did in the first. Yet some other time it may occur that he will not find it presenting the same appearance, until after ninety nights of observation. Must one conclude that all that which lies between is but an apparent change? Of course not! For some other observer whose first observation might, e.g., coincide with the observation made in the first observer's fifth night, notices another appearance which returns after, let us say, another thirty nights of observation. This second observer would, logically, have to look upon that same appearance of the moon-spot which presented itself in the first observer's fifth and thirty-fifth night as its real appearance and consider everything else which he has seen as merely apparent changes.

It is naturally much easier to come up with arguments against a mere difference of opinion than to struggle against such absolute nonsense as is represented by the thesis of the alleged apparent changes of the moon-spots and its motivation; especially when so absurd a thesis is being, as in this case, supported by authorities like college professors and the directors of large observatories.

No astronomer and no selenographer has yet, in so many words, expressed what he imagines that this "different illumination" on the Moon, this alleged cause for the different brightness of adjacent objects, should actually be like. For the Sun shines down upon the lunar landscapes from an allegedly cloudless sky and consequently with equal

force upon contiguous objects; how is it then possible that, as there exists no other source of light , there should be a "different illumination"? There is not a trace of logical thought in such a statement!

As to the motivation of the lunar landscapes' changed appearance in consequence of different "librations", this motivation goes back to theses which are almost three hundred years old, and have since been further developed on the basis of supplementary observations.

Already Galilei, who was the first to observe the Moon through a telescope, made the observation that there was a bright spot situated approximately in the center of the Moon's disk which did not stay at an equal distance from the Moon's edges, but, instead, kept oscillating here and there in the course of time. Galilei took it that there existed an oscillation of the Moon's disk which he called "libration". Yet he was in no position further to investigate this phenomenon, as he became blind soon after. Cassini and Hevel, who both lived in the second half of the XVII. Century noticed that this bright spot near the Moon's center which they called Manilius, oscillated upward and downward, as well as from right to left; after this they enlarged the theory of libration into that of the "latitudinal libration" and "longitudinal libration" and figured out their rules, the periods of their revolutions and the time of Manilius' return to its original position close to the center of the Moon's disk. From the displacements of the Moon's center they concluded that there must occur a displacement of the Moon's entire disk, and they declared that "the Moon shakes its face once a month from left to right and nods from the top toward the bottom" (Franz, page 29). The period of time which all these oscillations of the Moon's center require until the moment when Manilius returns to its old spot, that is to say near the Moon's center, is almost three years, and the

time during which Manilius then remains in approximately the same spot only 2 to 3 days; this position of the Moon's center which returns once every 3 years is called the "medium libration".

Since Maedler's days, however, not Manilius but a bright moon-spot which Maedler called "Moesting" and which is situated even near to the Moon's center, has been used for the measuring of its oscillations. In order to determine these oscillations the momentary distance of Moesting from the northern or southern, respectively from the western or eastern edge is measured.

Now it is extremely important to point to the fact that it is but being supposed, but that it cannot actually be proved that these oscillating motions of the Moon's center correspond to accordingly oscillating motions of the Moon's edges. For the Moon's edge is ever surrounded by a uniformly bright ring lacking any of those various nuances of brightness which have been explained as mountains and craters, and which are visible on the Moon's disk. In default of any trace of such brighter or darker spots on the Moon's edge there exists no possibility of stating the effects rigorously corresponding to the changes following those oscillations -- which have been called "librations" -- on the Moon's edges also.

The thesis which claims that the same oscillations which have been observed in the Moon's center also occur on the Moon's edge cannot therefore be proved by actual facts, and is merely supported by the thesis of "the Moon's Ever Rigid Face"; thus one thesis has to support another.

This discussion of the theses concerning the "libration" was necessary if we want to interest ourselves in Maedler's local definitions. Maedler says on page 13: "The librations make it more

difficult to draw up a consistent image of the Moon. For it is absolutely impossible to achieve a delineation of the Moon which should be but approximately satisfactory in the short and rare moments when the medium libration really does take place; it is, instead, necessary to observe the Moon in the most varied stages, and there results the necessity of reducing every measurement and every drawing to one and the same libration, for which purpose, of course, the medium libration is being chosen. For it is not only the general situation, but also the shapes of the objects which are considerably changed even from one evening to another in consequence of this circumstance." +)

After this necessary digression we may return to Maedler's measurements and local definitions of the fixed points.

Maedler's measurements undertaken for the purpose of local definition very frequently, even after having been reduced by him to the "medium libration", -- yielded such divergent local situations for one and the same moon-spot that Maedler must absolutely have arrived at the conclusion of the moon-spots' mobility had he not been a victim of the hypnotic influence of his "taboo"-- "the Moon's Ever Rigid Face". Thus, to quote just one among many examples , he undertook 16 measurments of the "Crater Cleomedes" in the course of the year 1831, on the following dates: April 19, April 20, May 21, May 22, June 18, June 19, June 20, June 22, July 17, July 20, July 21, July 22, July 24, August 17, August 17 (two measurements in one day), and August 18, out of which no less than

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+) The attempt at an explanation of the moon-spots' striking variability from one evening to the other by way of the librations, whose displacements during such a period of time are quite unsignificant, stands, as so many others statements do, in contrast to any logical thought. of Maedler.

9 measurements, namely those of April 19, April 20, May 22, June 18, June 19, June 20, June 22, July 21, and July 22 yielded results so divergent from the medium values, that he himself rejected them completely, giving as his reason the pure assumption that he had probably made errors in his measurements.

No verdict on Maedler's measurements, however depreciative and critical it might be, is more apt to show up their complete valuelessness than Maedler's own crushing estimate of them; in such an absolutely matter-of-course manner did Maedler look upon his own measurments and calculations as unreliable, that the appearance of a mere doubt in their correctness was for him sufficient to discard them as failures. Without going into any further investigation, and with an easy-going manner, which would not be permissible even at a game of cricket, Maedler simply concluded in this case also: "Out of the 16 measurements of Cleomedes, 9 " -- (that is to say more than half of them) -- "have been carried out incorrectly and their results must be rejected as being erroneous"! He cloaks the enormity of the procedure, which is revealed by these words, by the conscientiousness with which he describes his working-methods.

He then used the seven measurements "which had been found correct" for the calculation of a medium value for Cleomedes, yet even these remaining seven measurements had yielded results which lay far apart; the statements of their longitude move from $53^{\circ}42'$ to $55^{\circ}6'$, and those for the latitude from $27^{\circ}47'$ to $28^{\circ}46'$. Yet Maedler calculated exact local definitions, down to the seconds, for his map and for his text-book from these absolutely inexact and arbitrarily chosen figures. For it is a well-known fact that science lays great stress upon "exact figures" and "mundus vult decipi" Maedler's local definition for Cleomede

therefore reads: Longitude: 54°17'25", latitude 28°23'58".

For this is the very essence of Maedler's method of work: everyone who does not sound it into its depths wins from it a false impression of the most extraordinary accuracy. The local definitions for the other fixed points were figured out by Maedler in exactly the same manner, and just as arbitrarily, as had been the case with Cleomedes; and ~~it was~~ on the basis of these calculations he drew up that map which, to this day, spook-like, confuses the minds of astronomers.

When an astronomer of our own day, in making a re-measurement, cannot find some moon-spot, dubbed crater, in the place which had been assigned to it on Maedler's map, he need not worry his head for an explanation; all he need do is follow the traces of Maedler or of Professor Franz. He will then find himself in the position, according to his wishes, to make the libration, the illumination or some apparent change responsible for the fact. And there is yet another mysterious cause which he may mention: the "physical libration". For this is another expedient, upon hearing of which Old Nick, who probably has up to our own days been acting as the scene-shifter of lunar research, must burst out into his most fiendish laughter.

For the thesis of "physical libration" serves as a motivation for these displacements which are quite capable of proof, yet cannot be jammed in with either the "latitudinal libration" nor the "longitudinal libration". Maedler yet denies the physical libration (page 12) but Professor Franz admits it, and attributes it to an irregularity in the Moon's velocity of rotation; in 1912 Professor Franz wrote about this phenomenon on page 31: "This is where we have arrived at a delicate and tender point. For the physical libration is very slight, and yet it is noticeable. It was, until a short time ago,

unknown to astronomers."

Thus the thesis of "physical libration" was born of the "taboo" of "the Moon's Ever Rigid Face", also. The local displacements of individual moon-spots would otherwise have had to go unexplained; and thus in this case also, another youthful galimatias came to life in order to serve as stay and prop to the old galimatias and his already numerous family, and to keep them from being dropped.

It is however necessary in order to avoid misunderstandings, to mention the fact that the reader has not yet by far, in the course of this treatise, been introduced to all the up-to-date family offspring of old galimatias.

Chapter IV.

THE SCIENTIFIC TALE OF THE MOON IN THE YEAR 1936

As a conclusion in the work hitherto done, and as synopsis of his 52 years of painstaking and diligent observations of the Moon, Ph. Fauth has published a new book under the title "UNSER MOND"; this book, which has been published as late as 1936, is not merely the most recent but also, since Maedler's days, the most voluminous book in lunar literature. By far the largest part of it is devoted to descriptions and graphic accounts of individual moon-spots, the names of about 680 of which are mentioned by Fauth (Mr. Goodacre mentions but 520 names); Fauth's general reflections on the Moon are, however, rather scant and do not, generally speaking, differ from those which are to be found in his earlier books.

Fauth's very detailed descriptions of individual moon-spots include juxtapositions of individual observations made by all lunar investigators of renown, beginning by Maedler's predecessors, going as far as Goodacre and Fauth himself, and always referring to the maps and drawings published by each. And this most recent book "UNSER MOND" itself contains a map of the Moon measuring 87 cm in diameter.

Ph. Fauth, leading and most highly famed German lunar research-worker of our days, also in this work asserts himself as the high-spirited defender and knight of the thesis of "the Moon's Ever Rigid Face" and bases himself in this matter mainly on Maedler whose extraordinary merits on the line of lunar research he never wearies of

emphasising, and to whom he refers as "The Old Master". Following Maedler's example Fauth declares those among his own observations which do not tally with the thesis of the Moon's rigid face, to be yet unsolved enigmas, as for instance in the case of the bright rays; or he sets up new thesis, e.g. a priodical paling of the lunar territory, thus attempting to bring his observations into line with the thesis of the Moon's rigid face as well as with the "Welteislehre", to which he also adheres.

In those cases -- which Fauth mentions in large numbers -- where his own individual observations of moon-spots are not in accord with the individual observations of other selenologists and selenographers, he declares these latter ones to be erroneous or inaccurate, thus only permitting his very ownest statements to be considered as correct.

Yet it results from these juxtapositions -- just as it does from those contained in Mr. Goodacre's book "THE MOON" --, that there is hardly one moon-spot which has been identically described by several lunar observers.

The quotation and juxtaposition of so many individual observations made by the most highly-famed lunar research-workers for hundreds of moon-spots and in the most varied lunar phases which is to be found in Fauth's "UNSER MOND", is a to-be-hailed continuation of Goodacre's meritorious and highly informative book "THE MOON", and certainly represents a very valuable achievement on Fauth's part also. These collected observations are highly apt to quicken our understanding for the Moon's true nature as soon as they will be cut lose from their explanations which are made to suit both the crater theories and the "Welteislehre".

The basis of lunar research which Maedler has fixed remain, however, above all doubt for Fauth, and he consequently leaves

them unchecked. We find Maedler's questionable measurements of altitudes -- figured out by him in toises -- converted into meters and accompanying Fauth's individual descriptions of moon-spots in his most recent book; yet this source of information is not mentioned by Fauth, while in the case of a few other figures for altitudes, which originate from more recent publications in lunar literature, the names of the authors in question, for instance Schmidt, Neison, and so forth, are specially alluded to.

A few examples will most clearly show of which type the figures for altitudes which Fauth has taken over from Maedler and, after converting them into meters, has put down as calculated altitudes of individual moon-spots, really are:

First example:

CETUS E.: Maedler undertook three measurements, that is to say:

on September 23, 1834 he found 1846 toises
on December 10, 1835 he found 1792 toises
on January 9, 1836 he found 2128 toises

from the sum of 5766 toises he drew a medium value which, if figured out rightly, would have amounted to ..... 1922 toises. But Maedler made an arithmetical mistake and put down the wrong figure of ..... 1987 toises as medium value, which Fauth converts into 3870 meters (1 toise = 1,949 meters).

Second example:

MARIUS W.: Maedler took four measurements of Marius W, that is to say:

on June	18, 1834	he found	649 toises
on October	14, 1834	he found	745 toises
on January	11, 1835	he found	520 toises
on March	11, 1835	he found	741 toises

from the sum of 2655 toises he drew a medium value which, if figured out correctly should amount to ..... 664 toises; but also in this case Maedler made an arithmetical mistake and put down a wrong figure ..... 712 toises. This wrong figure is also converted by Fauth to 1390 meters.

Third example:

SIMPELIUS E.: Maedler undertook two measurements of Simpelius E :

on April	27, 1834	he found	1608 toises
on January	18, 1835	he found	2263 toises

from the sum of 3871 toises of these two figures which are very far apart he drew a medium value which should read ..... 1936 toises; but Maedler miswrote the figure and put down ..... 1963 toises; which Fauth converts into 3826 meters.

Also in other cases Fauth does not concern himself about the original figures of altitudes which Maedler calculated, but simply converts the medium figures given by Maedler in his text from toises into meters, thus transplanting even Maedler's purely arithmetical mistakes into his own book.

Fauth neither alludes to the fact that these are "medium" figures, nor to the fact that these as well as quantities of other figures are simply copied from Maedler's text-book.

Thus Ph. Fauth's most recent map of the Moon, and

his most recent book on the Moon which even surpasses Maedler's text-book in bulkiness (592 pages) have, with regard to the description of the Moon's surface, developed into a kind of suplemented re-edition of Maedler's book on and map of the Moon at the approximate time of Maedler's centenary.

Ph. Fauth's book "UNSER MOND" which has appeared in 1936, must therefore be considered as another striking proof of the fact that a thorough, scientific and critical checking of Maedler's book "DER MOND" also includes to-day's lunar literature in its totality; meaning the literature published by professional astronomers as well as, naturally, the subject-matter of the lunar instruction given in our colleges and observatories.